

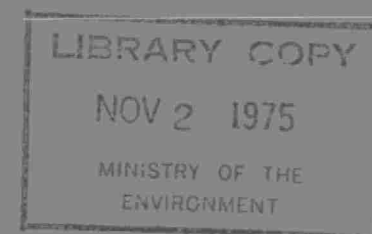
OPERATING SUMMARY

TOWNSHIP OF

RED LAKE

WATER TREATMENT PLANT and
WATER POLLUTION CONTROL PLANT

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MINISTRY OF THE ENVIRONMENT



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RED LAKE TWP.
WATER TREATMENT PLANT
and
WATER POLLUTION CONTROL PLANT

MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

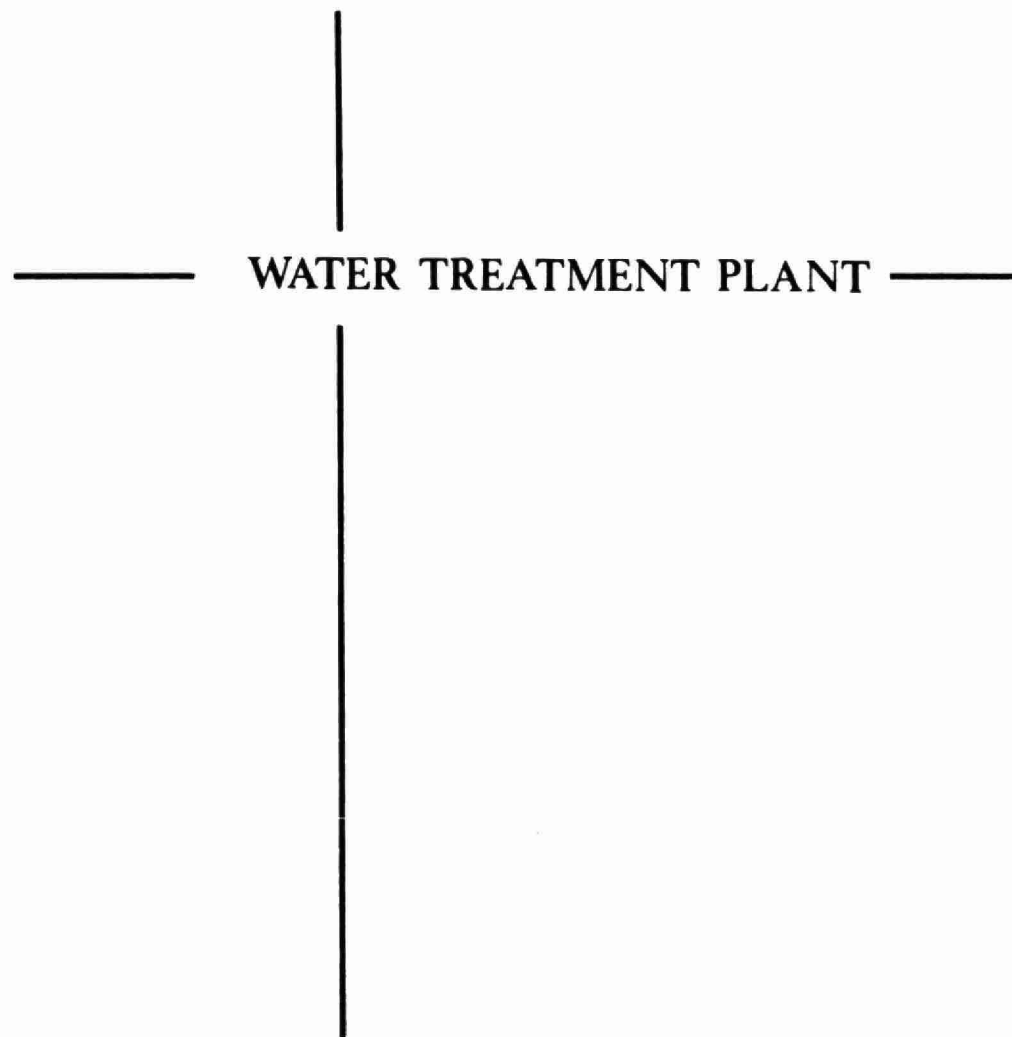
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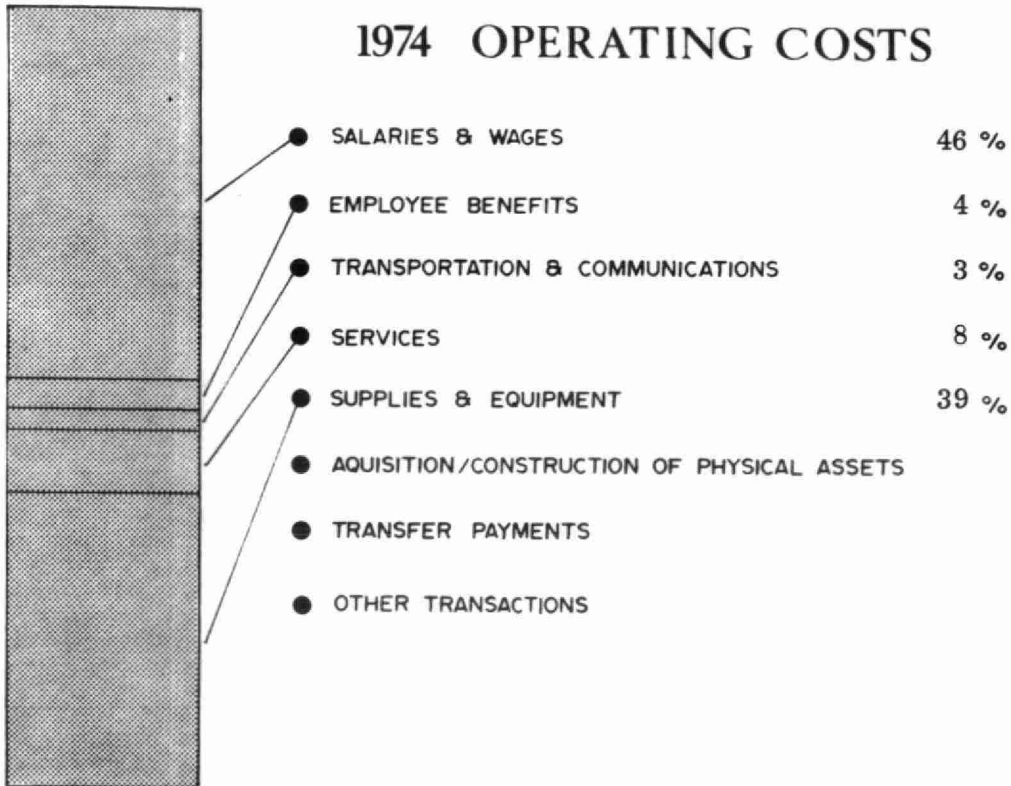
WATER POLLUTION CONTROL PLANT

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ANNUAL COSTS

1974 OPERATING COSTS



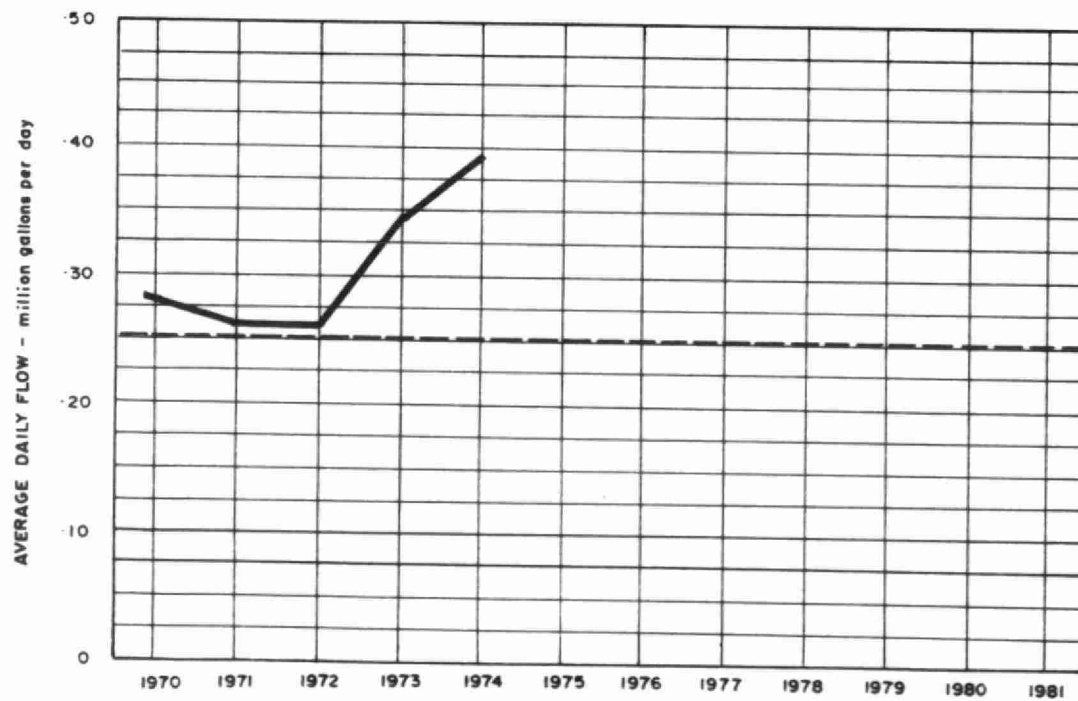
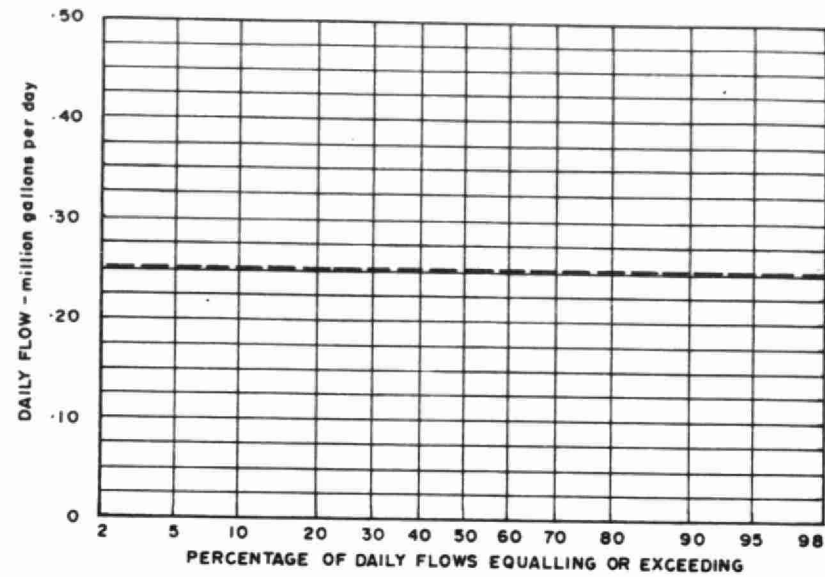
YEARLY OPERATING COSTS

YEAR	WATER TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS
			cents / 1000 gal.
1974	143	24,821	17

OPERATING EXPENDITURES

Regular Staff	\$ 10,907	\$
Casual (Unclassified) Staff	570	
TOTAL SALARIES AND WAGES		11,477
TOTAL EMPLOYEE BENEFITS		950
TOTAL TRANSPORTATION AND COMMUNICATIONS		764
Insurance	243	
Sludge Haulage	-	
Repairs and Maintenance	751	
Other Services	971	
TOTAL SERVICES		1,965
Machinery and Equipment	237	
Chemicals	670	
Utilities	4,356	
Other Supplies and Equipment	4,402	
TOTAL SUPPLIES AND EQUIPMENT		9,665
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		-
TOTAL TRANSFER PAYMENTS		-
OTHER TRANSACTIONS		-
GRAND TOTAL	GRAND TOTAL	\$ 24,821

PROCESS DATA FLOWS

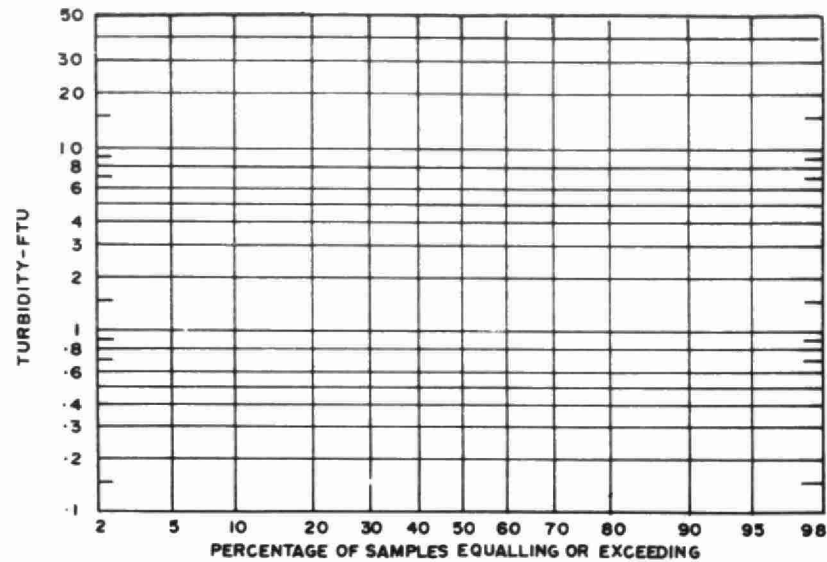


DESIGN CAPACITY — — — — —

PLANT PERFORMANCE

MONTH	FLOWS				RAW WATER		TREATED WATER					
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	MAXIMUM RATE mgd	TURBIDITY (AVERAGE) FTU	COLOUR (AVERAGE) App. units	TURBIDITY		COLOUR		TEMPERATURE	
							AVERAGE FTU	MAXIMUM FTU	AVERAGE App. units	MAXIMUM App. units	AVERAGE ° F	MAXIMUM ° F
JAN	18.46	.48	.52		1.5	20	1.5	1.5	15	15		
FEB	14.02	.50	.57		1.4	15	.7	1.0	8	15		
MAR	15.43	.50	.53									
APR	14.06	.47	.50		.5	30	.4	.6	22	30		
MAY	11.54	.37	.52									
JUNE	9.94	.33	.46		.7	20	1.0	1.0	30	30		
JULY	10.56	.34	.42									
AUG	8.19	.26	.37		1.1	40	1.3	1.3	30	30		
SEPT	8.75	.29	.31		1.3	40	.8	.8	30	30		
OCT	9.96	.32	.36		1.3	30	1.0	1.0	30	30		
NOV	10.61	.35	.39		.8	30	.7	.7	15	15		
DEC	11.80	.38	.42		.6	30	.6	.6	30	30		
TOTAL	143.32											
AVG.		.39	MAXIMUM .57	MAXIMUM	1.0	28	.9	MAXIMUM 1.5	23	MAXIMUM 30		MAXIMUM

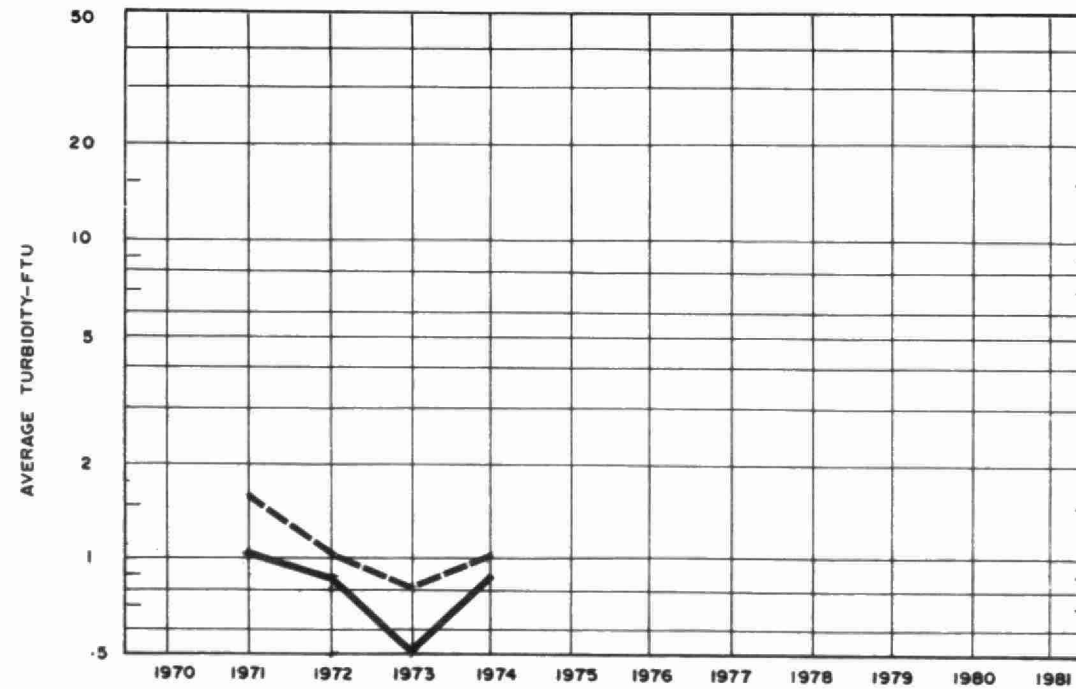
TURBIDITY



RAW WATER

TREATED WATER

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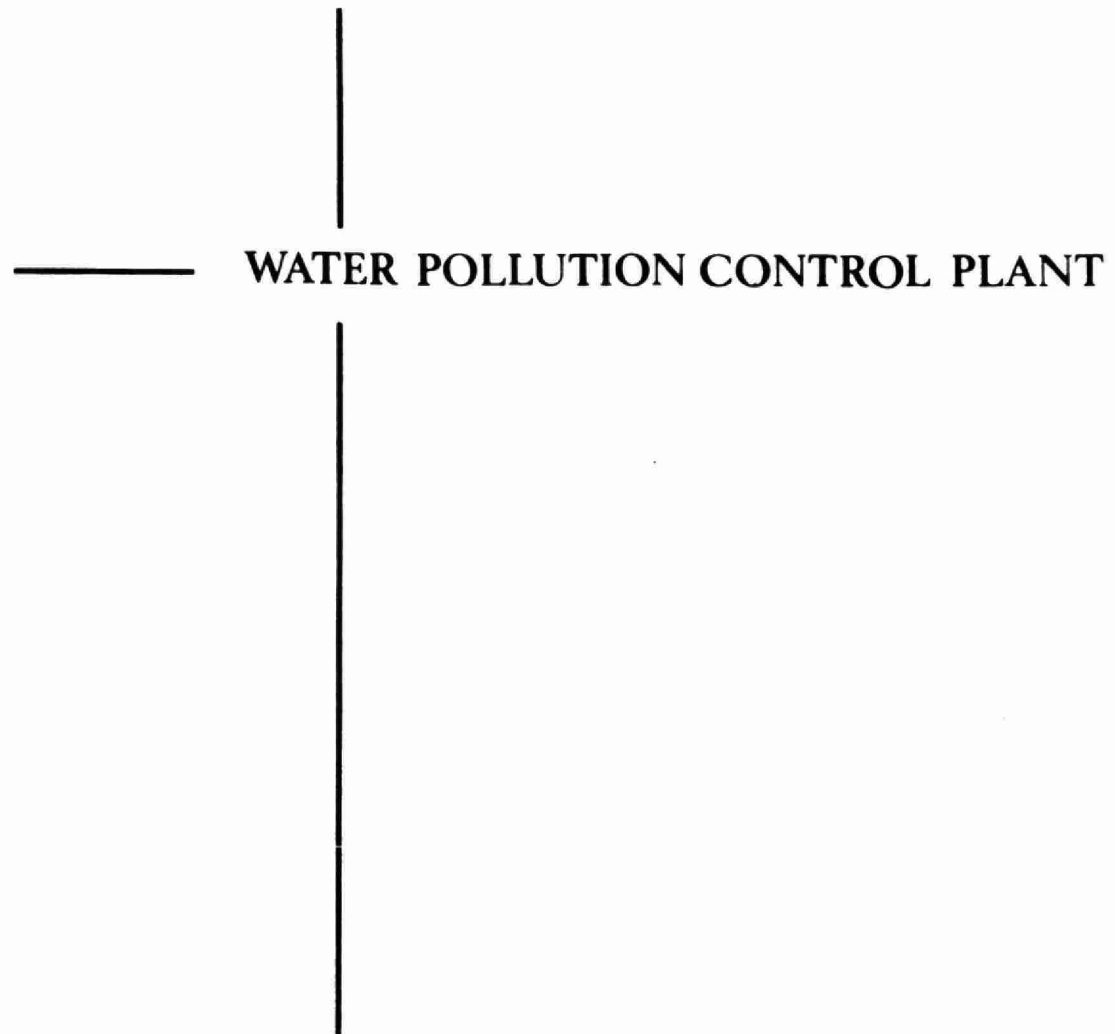


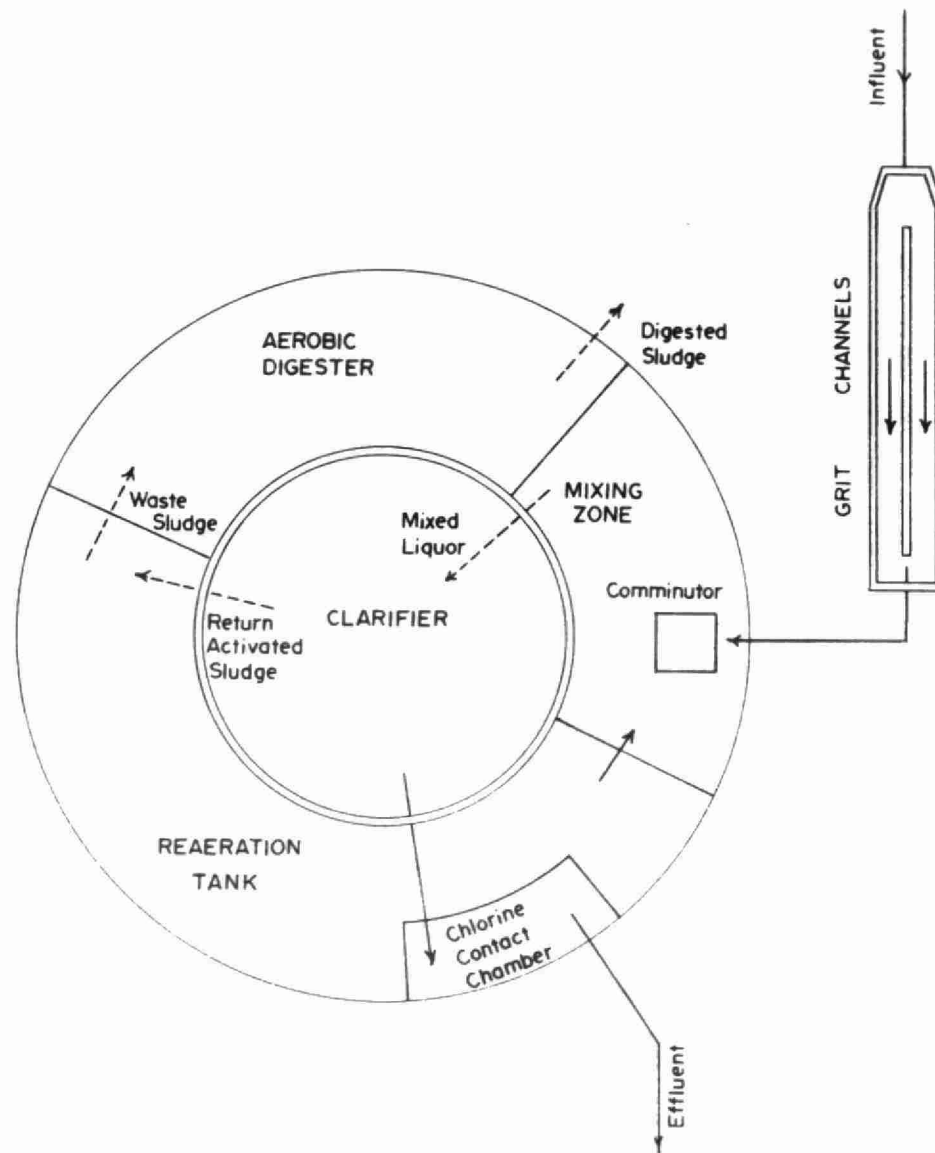
CHLORINATION and DISINFECTION

MONTH	RAW WATER					PLANT EFFLUENT		DISTRIBUTION SYSTEM		CHLORINATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	TOTAL AMOUNT OF CHLORINE USED pounds	DOSAGE		RESIDUAL IN PLANT EFFLUENT mg/l
	0	1 - 3	4 - 32	33 - 320	> 320						PRE - mg/l	POST - mg/l	
JAN	0	0	0	0	0					367	2.0		0.6
FEB	2	0	1	0	0	3	0	0	0	350	2.5		0.6
MAR	3	0	0	1	0	4	0	0	0	386	2.5		0.7
APR	0	0	2	2	0	4	0	0	0	338	2.4		0.7
MAY	0	0	2	2	0	4	0	0	0	326	2.8		0.7
JUNE	0	0	2	0	0	2	0	13	0	299	3.0		0.7
JULY	1	0	1	4	0	2	0	18	3	377	3.5		0.7
AUG	0	2	0	2	0	4	0	12	0	333	4.1		0.7
SEPT	0	0	2	2	0	3	0	10	4	305	3.5		0.8
OCT	0	0	0	4	0	4	0	6	0	311	3.1		0.8
NOV	0	1	3	0	0	4	0	4	0	313	3.0		0.7
DEC	2	1	1	0	0	4	0	4	0	341	2.9		0.8
TOTAL	8	4	14	17	0	38	0	67	7	4046			
AVG.	13 (NOTE - Average shown is the GEOMETRIC MEAN)									11 pounds per day	2.8		0.7

WATER QUALITY

PROPERTY	RAW WATER				TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as CaCO_3	11	29	44	24	11	29	40	24	80 - 100
ALKALINITY in mg/l as CaCO_3	11	24	32	20	11	20	32	13	30 - 100
IRON in mg/l Fe	11	.15	.35	.05	11	.12	.20	.05	Less than 0.3
CHLORIDE in mg/l Cl^-	11	1	3	<1	11	2	4	<1	Less than 250
pH in pH units	11	6.9	7.3	6.6	11	6.6	7.0	6.0	7.0 - 8.5





RED LAKE TWP WPCP
WATER POLLUTION CONTROL PLANT

DESIGN DATA

PROJECT Red Lake Twp. WPCP

PROJECT NO. 1-0040-66

TREATMENT Contact Stabilization

DESIGN FLOW 0.3 mgd

BOD - Raw Sewage 510 lb/day

RAW SEWAGE PUMPING:

Pumping Station 1

Two, 430 USGPM at 68' TDH

Pumping Station 2

Two, 125 USGPM at 51' TDH

PRETREATMENT

GRIT CHANNELS:

Two, each 20' x 2' x 2'8" swd

Volume: (each) 650 I. Gal. Detention: (each) 3 min.

BAR SCREENS:

$\frac{1}{4}$ " x 2" steel bars on 2" centers

BIOLOGICAL TREATMENT

MIXING TANK:

Volume: 33,400 I. Gal.

Contact Time: 2.7 hours

REAERATION TANK:

Volume: 77,400 I. Gal.

CLARIFIER:

25'8" dia. x 15' swd

Volume: 48,200 I. Gal.

Detention: 3.9 hours

Overflow Rate: 580 I. Gal/ft²/day

AEROBIC DIGESTER:

Volume: 48,000 I. Gal.

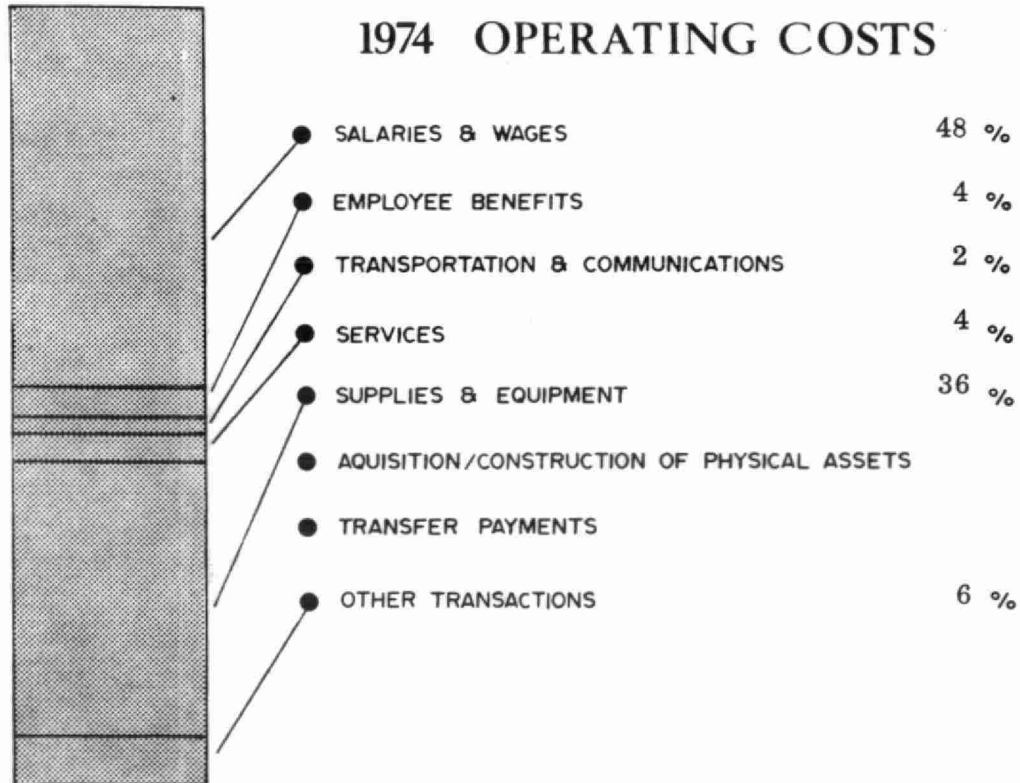
CHLORINE CONTACT CHAMBER:

Volume: 8400 I. Gal.

Detention: 40 min.

ANNUAL COSTS

1974 OPERATING COSTS



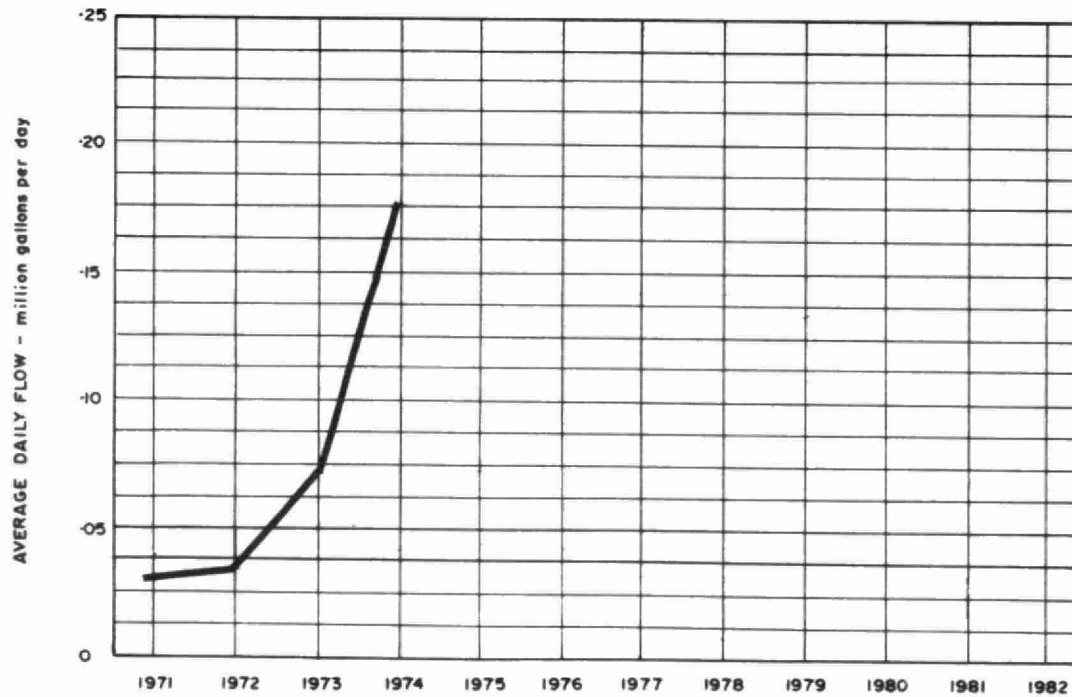
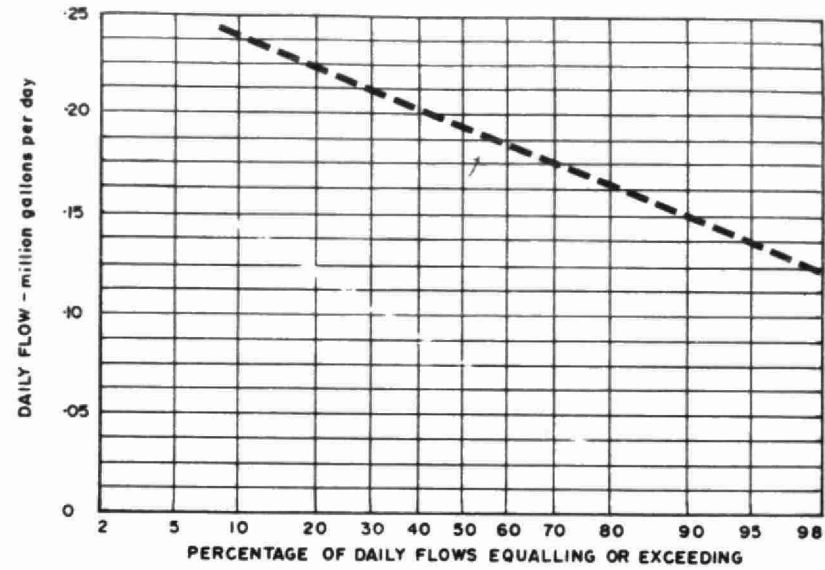
YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G.	¢/lb BOD
1974	69.6	21,783	313	39

OPERATING EXPENDITURES

Regular Staff	\$ 9,649	\$
Casual (Unclassified) Staff	529	
TOTAL SALARIES AND WAGES		10,178
TOTAL EMPLOYEE BENEFITS		970
TOTAL TRANSPORTATION AND COMMUNICATIONS		532
Insurance	343	
Sludge Haulage	8	
Repairs and Maintenance	495	
Other Services	125	
TOTAL SERVICES		971
Machinery and Equipment	402	
Chemicals	840	
Utilities	5,382	
Other Supplies and Equipment	1,213	
TOTAL SUPPLIES AND EQUIPMENT		7,837
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		
TOTAL TRANSFER PAYMENTS		
OTHER TRANSACTIONS		1,295
GRAND TOTAL	GRAND TOTAL	\$ 21,783

PROCESS DATA FLOWS

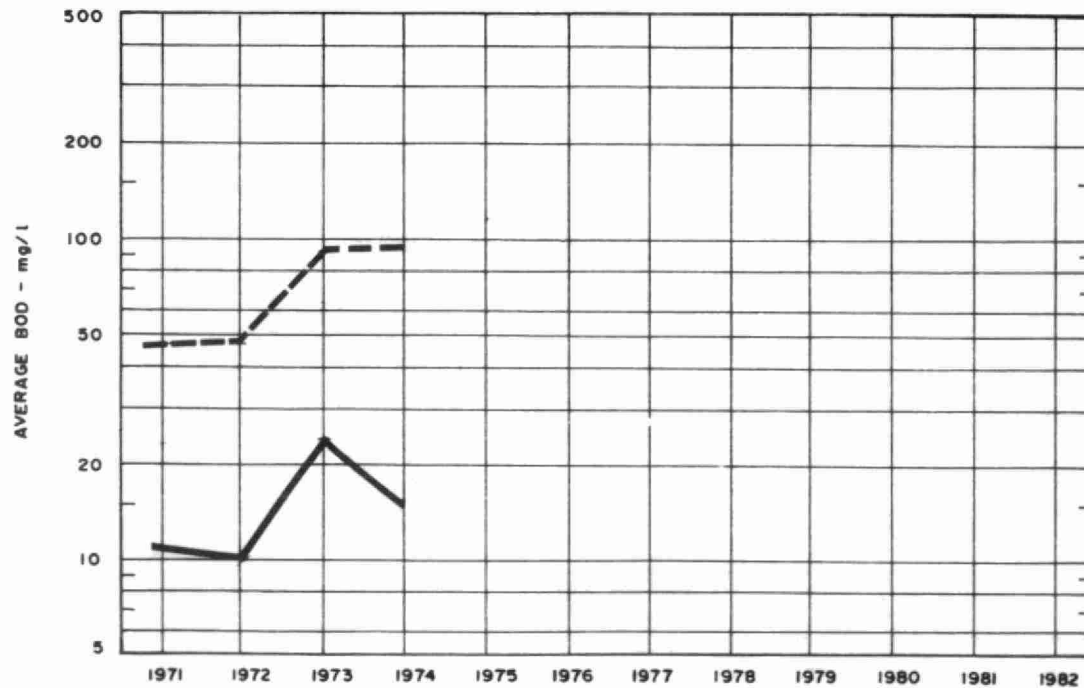
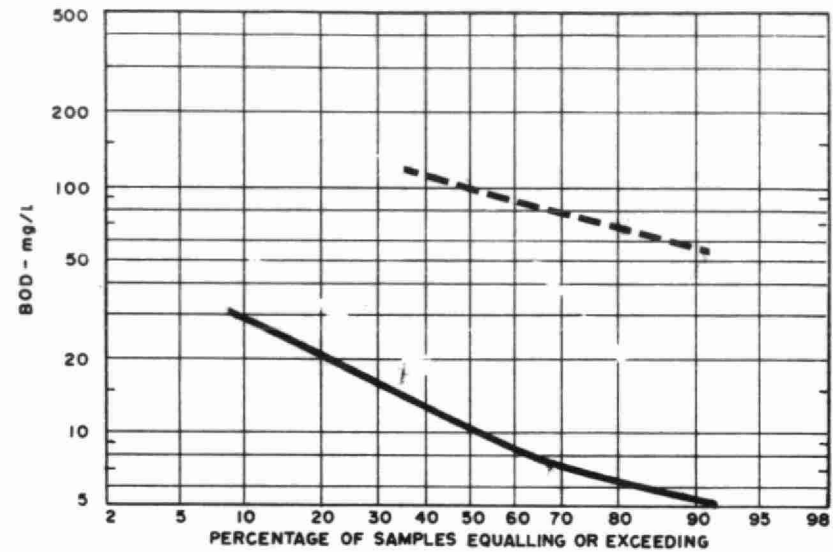


DESIGN CAPACITY 0.25 MGD

PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	4.41	.14	.21					65	25	61	2	6.1	2.3
FEB	5.66	.20	.21	95	28	71	4	85	20	76	4	4.1	2.1
MAR	6.29	.20	.21										
APR	8.70	.29	.49	65	28	57	3	90	45	50	4	3.5	2.0
MAY	7.69	.24	.29										
JUNE	6.17	.20	.26		11				30				1.5
JULY	5.40	.17	.21	80	10	86	4	80	10	86	4	5.3	1.9
AUG	5.50	.17	.23	140	5	96	7	100	5	96	5	8.9	.8
SEPT	4.64	.15	.18	75	9	88	3	190	15	92	8	6.0	2.6
OCT	5.05	.16	.18	90	7	92	4	120	5	96	6	7.7	1.9
NOV	4.84	.16	.18	140	6	96	6	200	10	95	9	8.1	2.9
DEC	5.28	.17	.18	120	19	84	5	110	10	91	5	7.0	3.1
TOTAL	69.63	-	-	-	-	-		-	-	-		-	-
AVG.		.18	MAXIMUM .49	97	16	84	4.7	110	20	82	5.2	5.8	2.1
No. of Samples	-	-	-	10	11	-	-	11	12	-	-	11	12

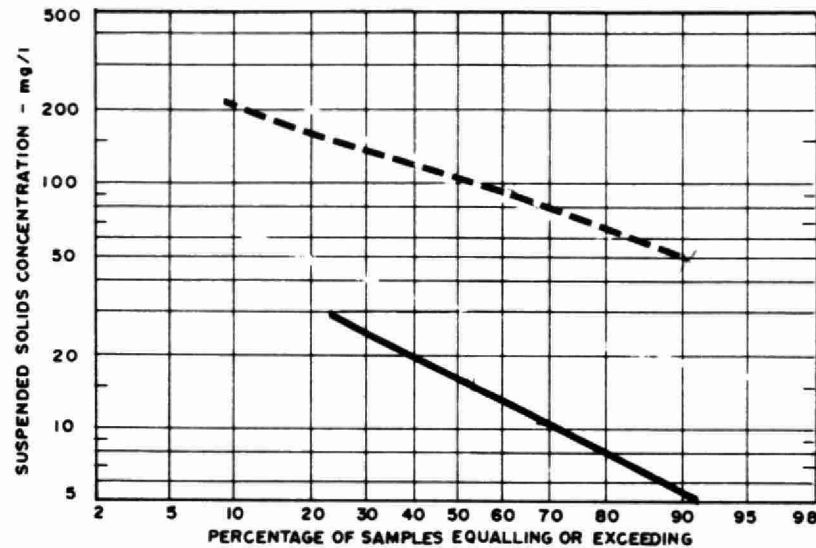
BIOCHEMICAL OXYGEN DEMAND



PLANT INFLUENT - - - - -

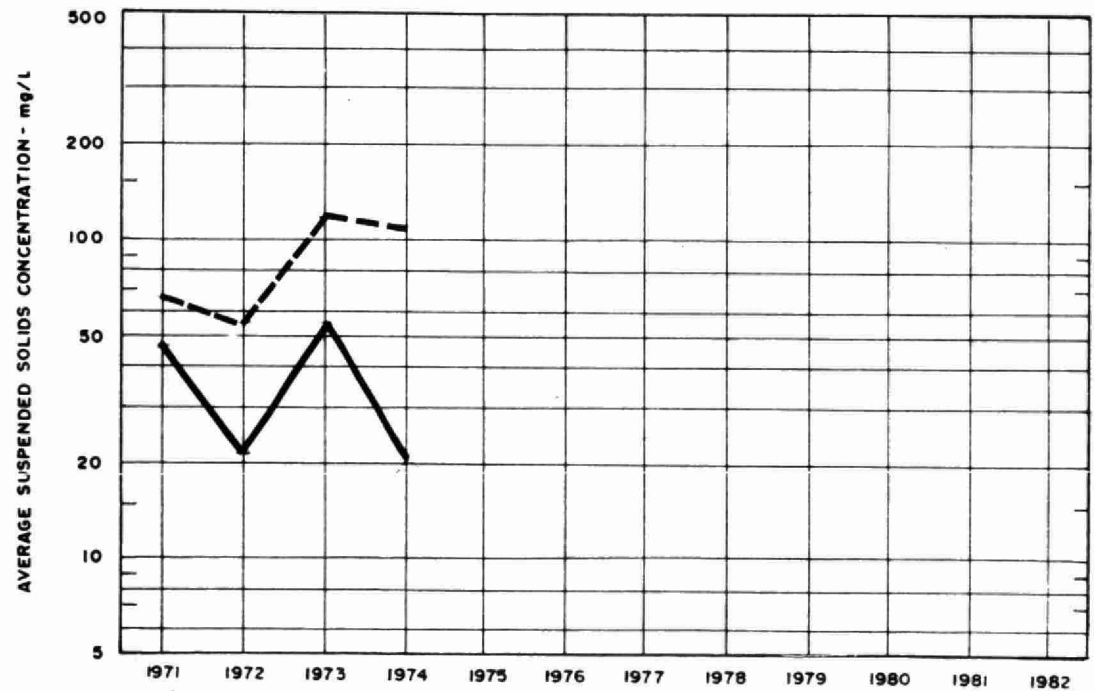
PLANT EFFLUENT _____

SUSPENDED SOLIDS

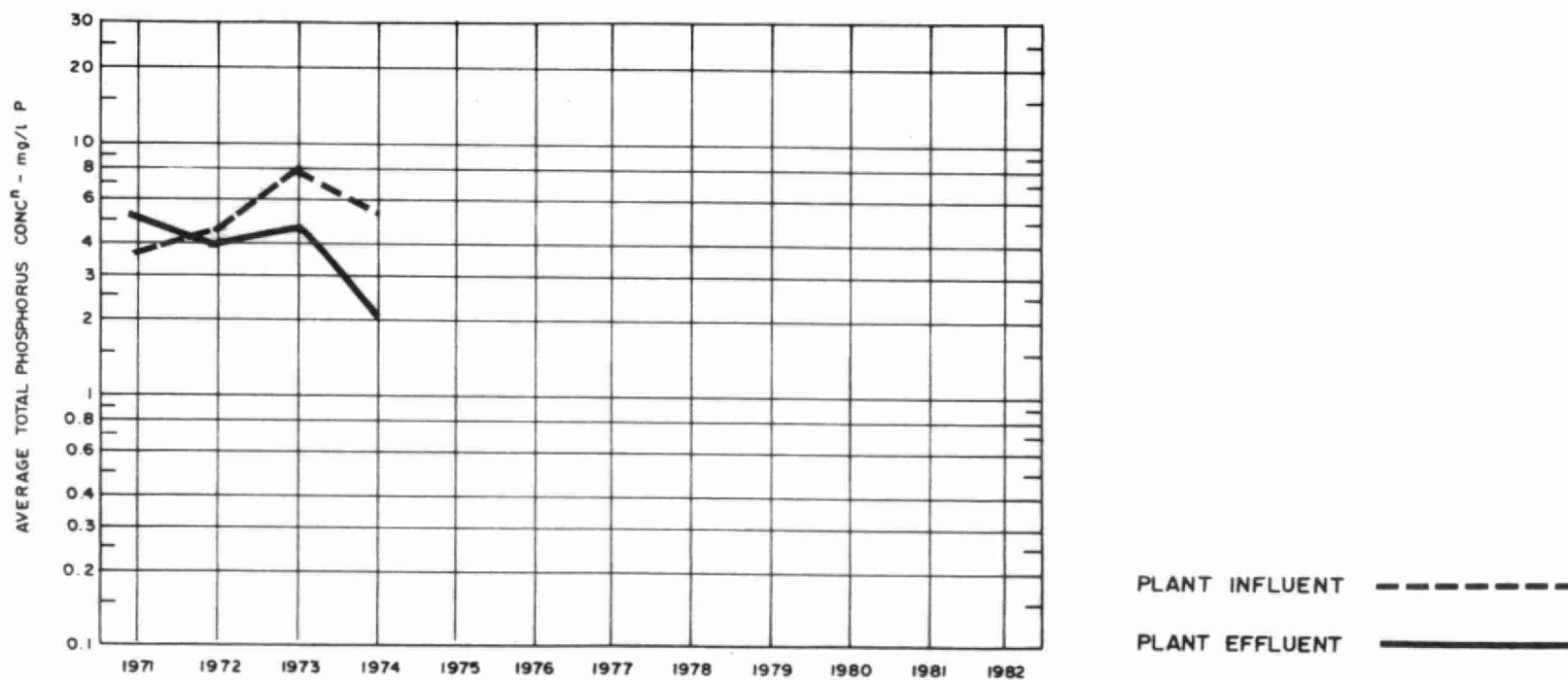
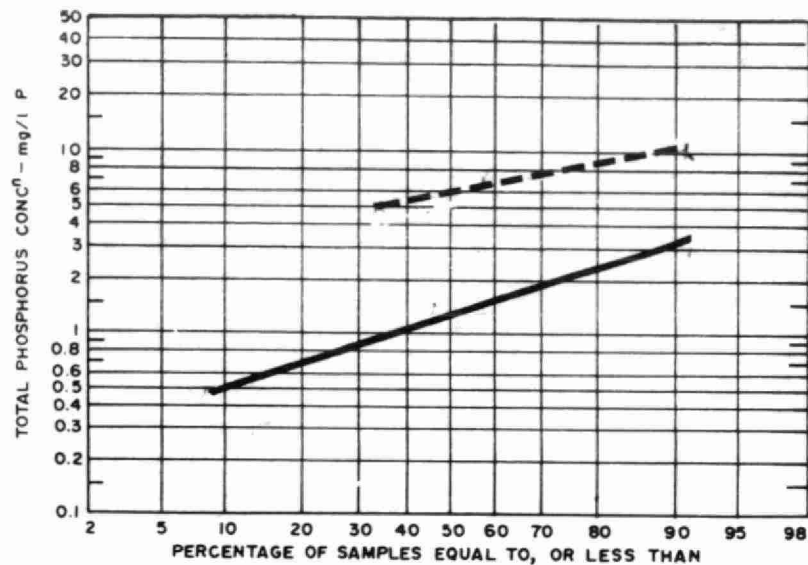


PLANT INFLUENT - - - - -

PLANT EFFLUENT —————



PHOSPHORUS



TREATMENT DATA

MONTH	GRIT	CHLORINATION		AERATION			WASTE SLUDGE			AEROBIC DIGESTER			
	QUANTITY REMOVED	CL ₂ USED	AVG. DOSAGE	MLSS. CONC	F/M	AIR USED	QUANTITY	SUSPENDED SOLIDS	VOL. SOLIDS	QUANTITY REMOVED	SUSPENDED SOLIDS	VOL. SOLIDS	AMOUNT HAULED
	cubic feet	pounds	mg/l	mg/l	day ⁻¹	$\frac{1000 \text{ ft}}{\text{lb BOD}}$	10 gallons	mg/l	%	10 ³ gallons	mg/l	%	cubic yards
JAN	16	157	3.6										
FEB	11	133	2.4	9300	.02						24400		
MAR	9	178	2.8										
APR	13	189	2.2	9800	.01						23500		
MAY	19	192	2.5										
JUNE	9	174	2.8	12300							25100		
JULY	16	165	3.0	10100	.01					18.0	31200		107
AUG	18	171	3.1	11200	.02					23.3	26000	46	139
SEPT	10	152	3.3	5100	.02						37300	44	
OCT	11	153	3.0	5800	.02					17.5	33900	46	104
NOV	10	123	2.6	7700	.02						20500	47	
DEC	8	186	3.5	7800	.02						27500	47	
TOTAL	150	1973	-	-	-	-		-	-	58.8	-	-	350
AVG.	2.2 cu. ft/mil gal	164	2.8	8800*	.02*						27700	46	

* Based on contact + reaeration tank

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